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(54) **WRITING INSTRUMENT**

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(51) **Int. Cl.**

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B43K 7/12	(2006.01)
B43K 24/00	(2006.01)
B43K 7/00	(2006.01)
B43K 24/06	(2006.01)

(52) **U.S. Cl.**
CPC ***B43K 7/005*** (2013.01); ***B43K 7/12*** (2013.01); *B43K 5/16* (2013.01); *B43K 24/06* (2013.01)

(58) **Field of Classification Search**
CPC B43K 5/16; B43K 7/12; B43K 23/004; B43K 23/008; B43K 23/012; B43K 24/00; B43K 24/02; B43K 24/06
USPC 401/6, 7, 48, 71, 75, 79, 99, 116, 251
See application file for complete search history.

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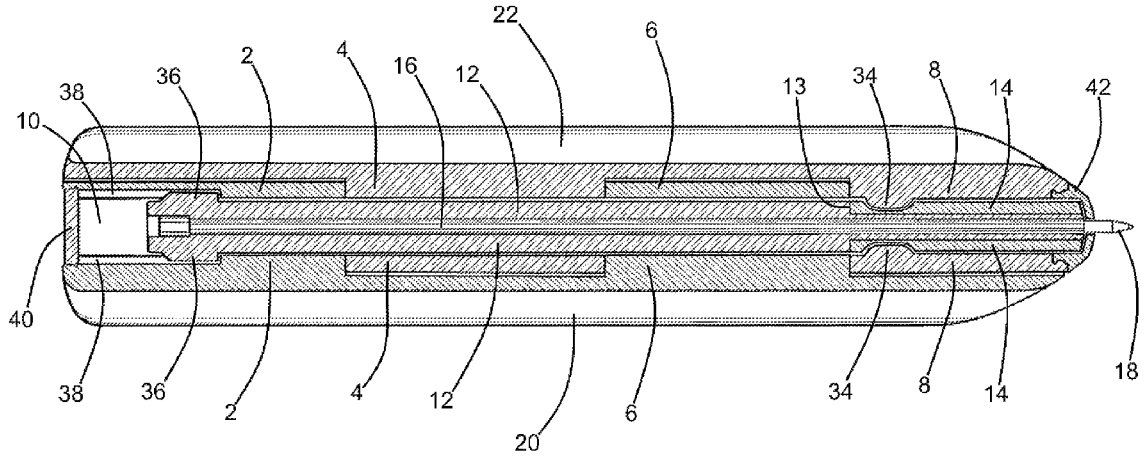
(57) **ABSTRACT**

A writing instrument incorporating a plurality of knuckles arranged in a longitudinal series; a tube member and scribing pen combination extending through the knuckles wherein the scribing pen is mounted within the tube member and has a longitudinal scribing end; and incorporating first and second leaves, each leaf among the first and second leaves having proximal and distal ends, the first and second leaves being connected operatively to the knuckles for movement between closed and opened positions, the distal ends being adjacent each other upon movements of the first ad second leaves to their closed positions, the distal ends being displacing circumferentially from each other upon movements of the first and second leaves toward their opened positions.

7 Claims, 6 Drawing Sheets



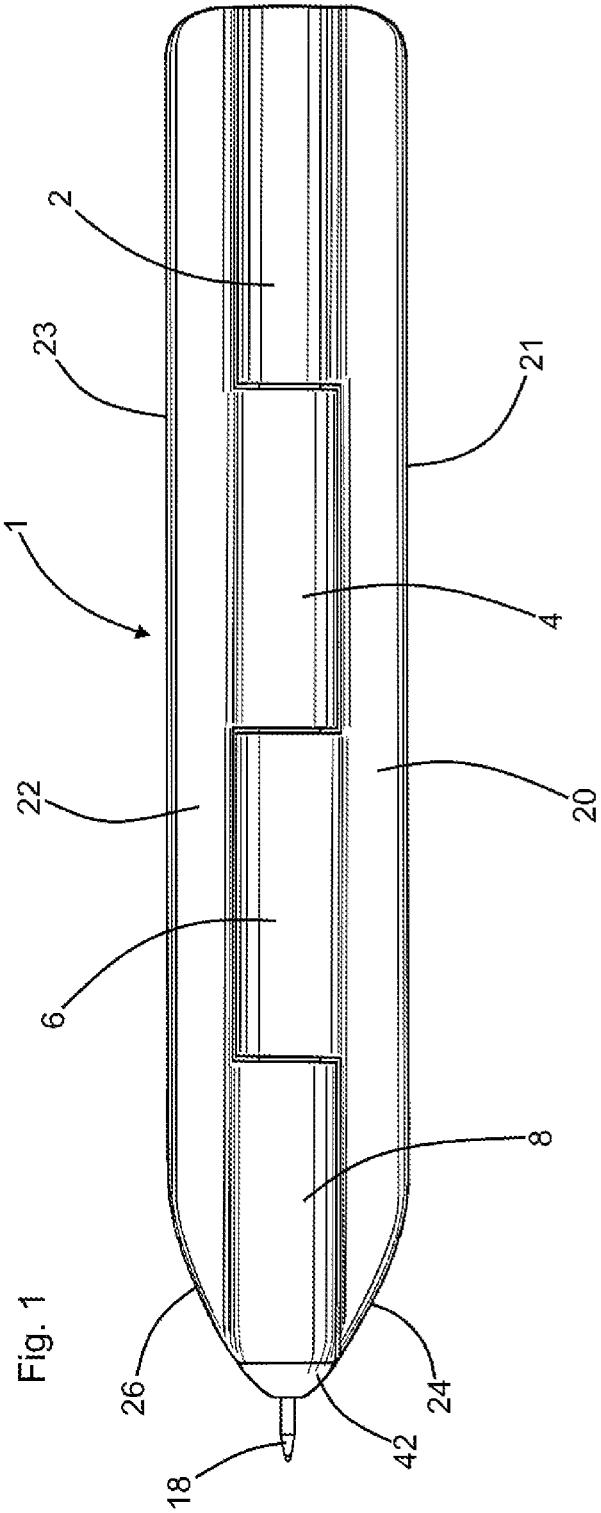
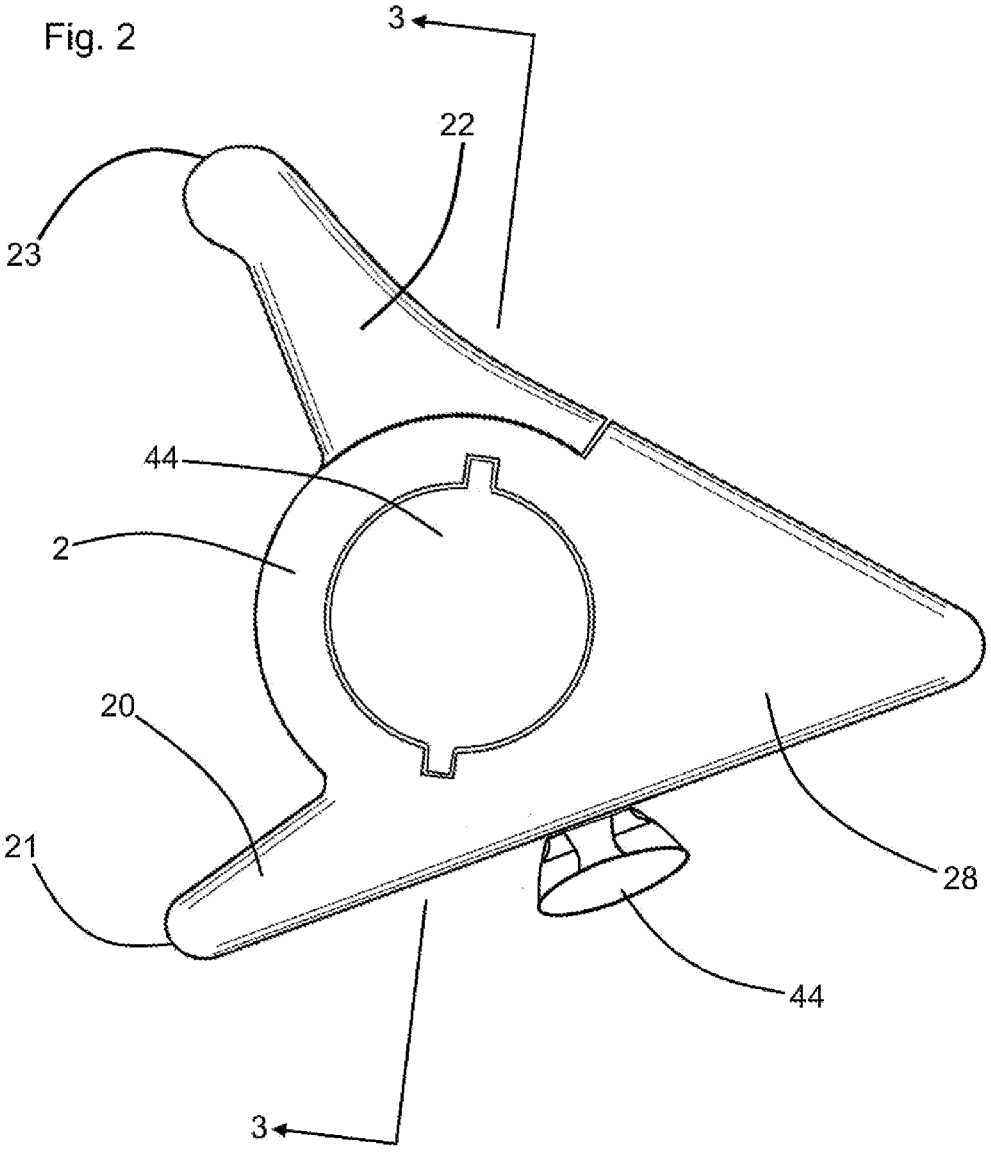


Fig. 1

Fig. 2



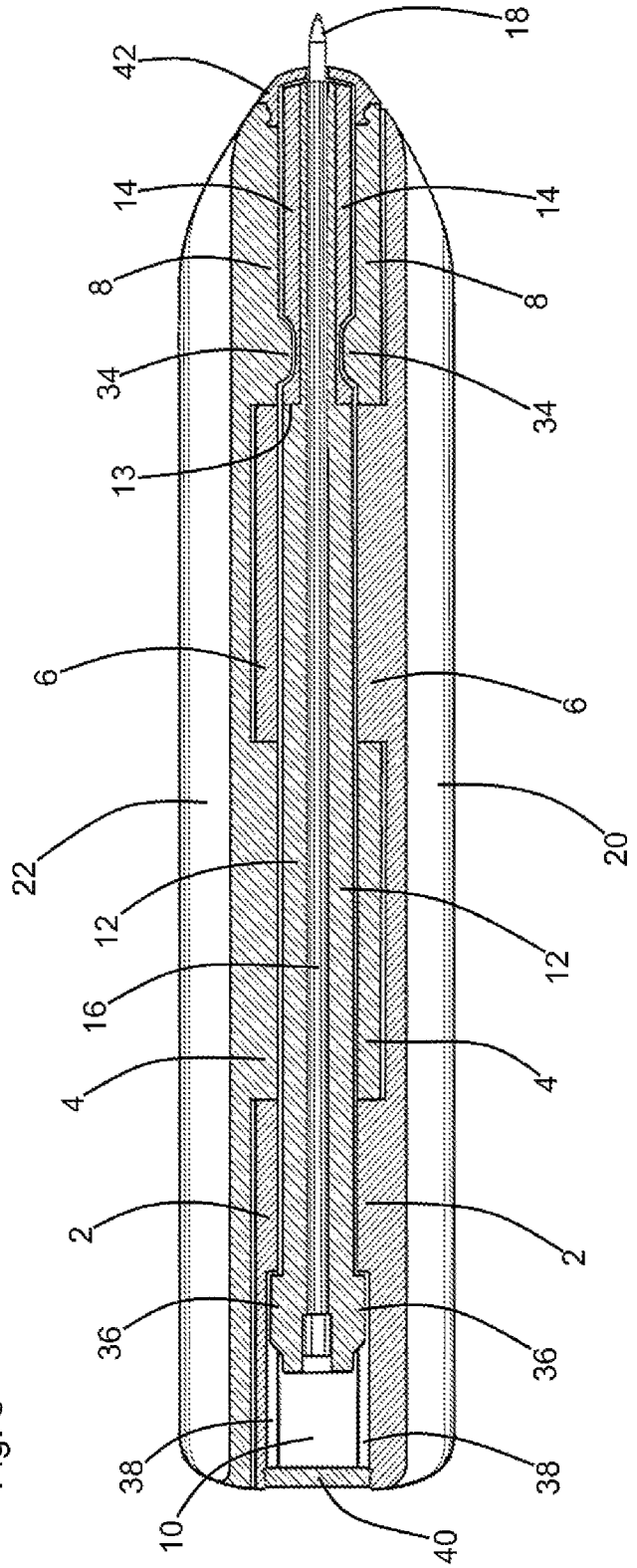


Fig. 3

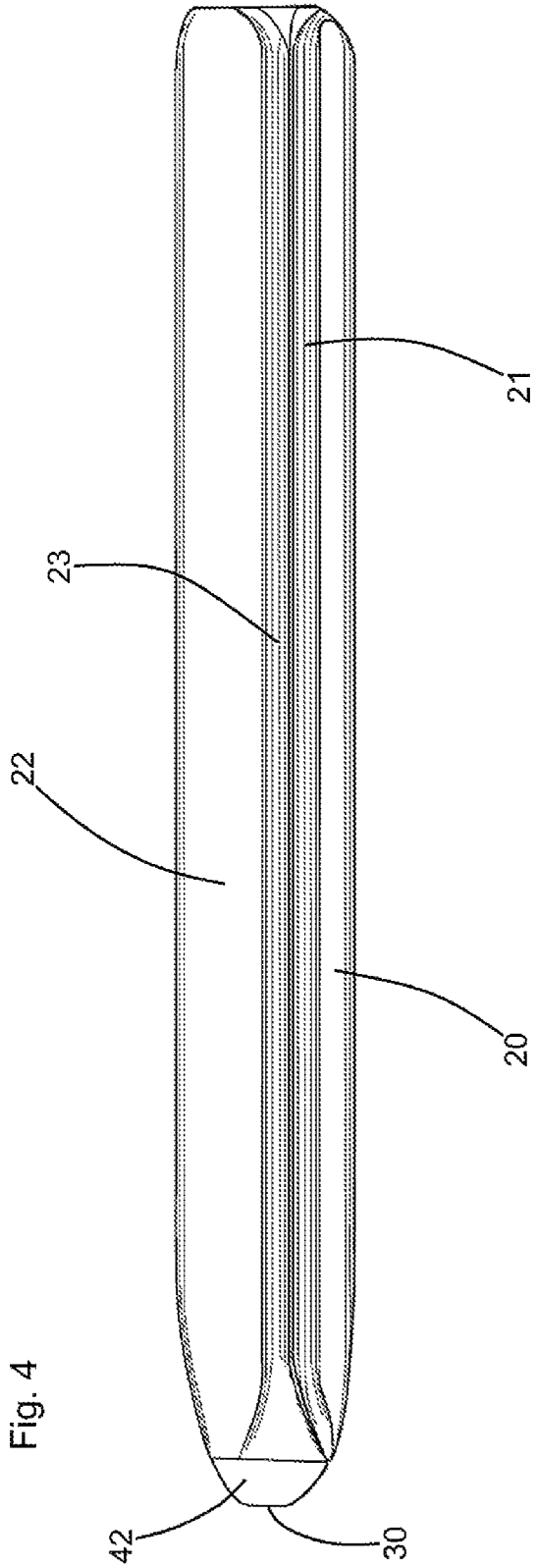
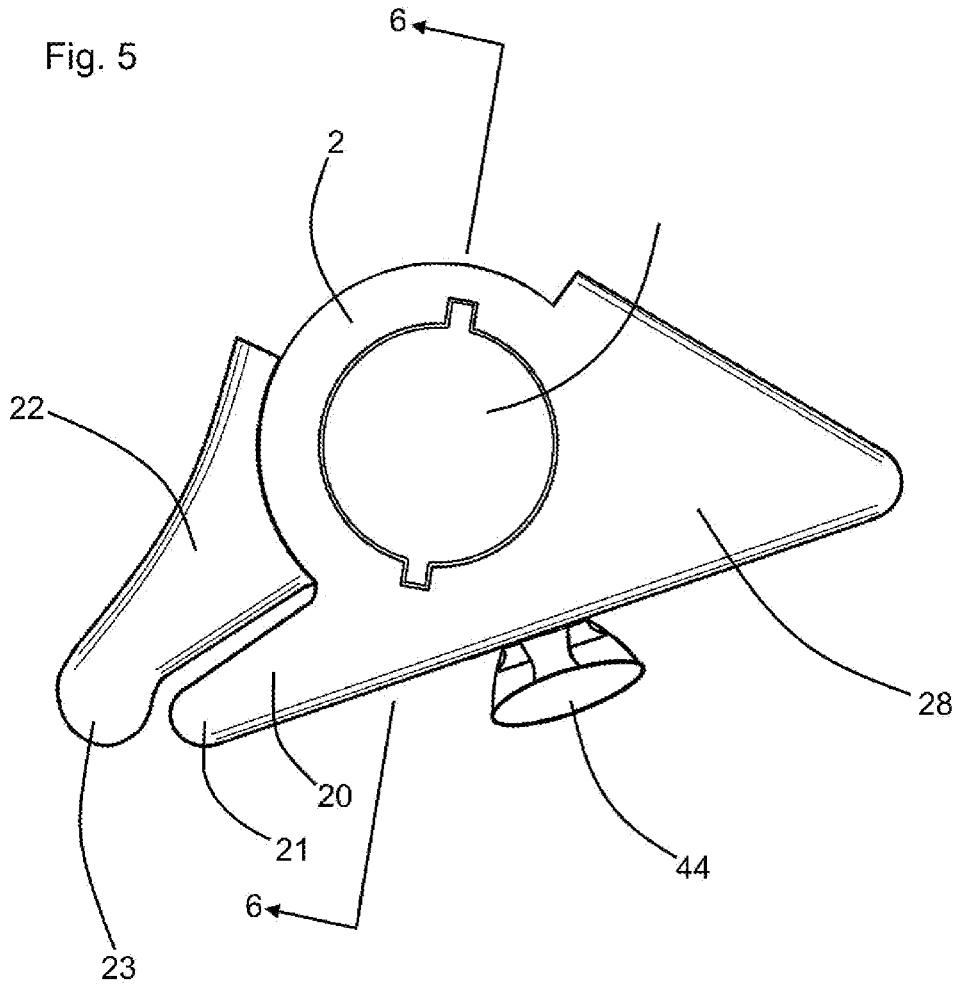


Fig. 4

Fig. 5



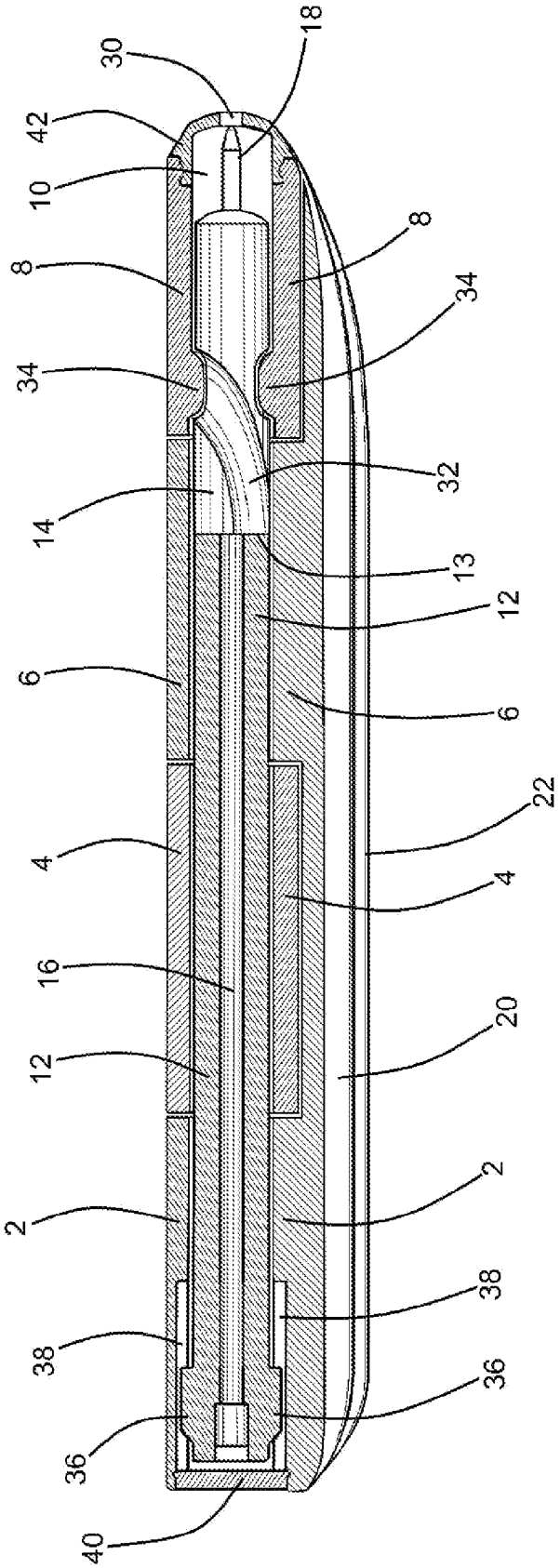


Fig. 6

WRITING INSTRUMENT

REFERENCE TO PREVIOUSLY FILED AND CO-PENDING APPLICATION COMMONLY OWNED BY THE INSTANT INVENTOR AND APPLICANT

The inventor and applicant in the instant application is the same person as the inventor and applicant in U.S. patent application Ser. No. 14/053,138 filed Oct. 14, 2013, and entitled "Writing Instrument". Said previously filed patent application remains pending at the date of filing of the instant application.

FIELD OF THE INVENTION

This invention relates to writing instruments such as pens, markers, and pencils. More particularly, this invention relates to such writing instruments whose body portions are adapted for ergonomic grasping and holding by the fingers of a writer's hand.

BACKGROUND OF THE INVENTION

Common pens and pencils having a barrel shaped or cylindrical body are often grasped by the thumb, index, and middle fingers of a writer's hand. During such use, the tip of the index finger, the tip of the thumb, and the proximally lateral side of the writer's middle finger are typically placed over contact points arrayed at approximately 120 degree intervals about the cylindrical body of the instrument. Such common writing instrument holding technique, when applied to a common cylinder bodied pen undesirably and unergonomically allows the body of the pen to roll over the contact points resulting in undesirable pen instability during writing.

The instant inventive writing instrument solves or ameliorates the problems, difficulties, and deficiencies of common barrel body pens and pencils described above, by specially configuring the pen's body to define a pair of hinge leaves which pivotally move about a series of hollow bored hinge knuckles, the hinge leaves being capable of alternately moving between a compact and collapsed closed non-use position and opened and substantially triangular cross-sectional writing configuration. The special configuration of the instant invention incorporates scribing means such as a pen or pencil which extends within and through aligned bores of the hinge knuckles. The special configuration preferably further incorporates extending and retracting means which operatively move the scribing hinge pin and are actuated by pivoting motions of the instrument's hinge leaf body portions.

BRIEF SUMMARY OF THE INVENTION

A first structural component of the instant inventive writing instrument comprises a plurality of hollow bored knuckle or sleeve components which are arranged in a longitudinally extending series. In the preferred embodiment, the knuckle components are configured similarly with the series of hinge pin receiving sleeves or knuckles of a common double leaf door hinge. In a preferred embodiment, four knuckles are provided. Suitably, fewer or a greater number of knuckles may be provided and fall within the scope of the invention. The number of the instrument's knuckles is preferably even so that leaf components which they support may counter-rotate end knuckles with respect to each other.

A further structural component of the instant inventive writing instrument comprises a tube member and scribing means combination. In the preferred embodiment, the annular or cylindrical outer periphery of the tube member is fitted for sliding insertion into and through the aligned bores of the plurality of knuckles. Also in the preferred embodiment, the scribing means comprise a marker such as a pencil, a ballpoint pen, a felt-tipped marker, or a paint pen, such scribing means preferably being tubularly configured and fitted for extension in the manner of a quill and shaft combination into the hollow bore of the tube. Upon extension of the tube and scribing means combination through the aligned bores of the knuckles, such combination may effectively facilitate relative counter-rotating movements of the knuckles in the manner of a common hinge pin.

Further structural components of the instant inventive writing instrument comprise first and second leaves which are fixedly attached to or are formed wholly with the knuckles, such leaves being mounted to the knuckles in a manner similar to the mountings of leaves upon the knuckles of the common double leaf hinge. In a preferred embodiment, the leaves are configured so that upon pivoting circumferential motions of the leaves to an opened writing use position, the cross sectional shape of the writing instrument becomes substantially triangular for facilitating secure holding and ergonomic writing. Opposite pivoting of the writing instrument's leaves to bring their distal ends together advantageously reconfigures the instrument for collapsed and compact storage.

In a preferred embodiment, the instant inventive writing instrument further comprises means for alternately longitudinally extending the tube and scribing means combination from a longitudinal end of the knuckles and oppositely-longitudinally retracting such combination. While such extending and retracting means may suitably comprise a common ballpoint pen click actuator, the tube and knuckles are preferably specially configured so that pivoting motions of the leaves actuate the extensions and retractions of the scribing elements. Incorporation of a helical slide channel and slide ridge linear motion actuator at the annular junctures of the tube and the knuckles' bores may advantageously longitudinally move the scribing element upon opening of the leaves, and may oppositely retract the scribing element upon the leaves' closure.

Accordingly, objects of the instant invention include the provision of a writing instrument which incorporates structures, as described above, and which arranges those structures in relation to each other in manners described above, for achievement of the advantages and benefits described above.

Other and further objects, benefits, and advantages of the present invention will become known to those skilled in the art upon review of the Detailed Description which follows, and upon review of the appended drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side view of the instant inventive writing instrument, the view showing body leaf components pivoted to their opened positions.

FIG. **2** is a base end or oppositely-longitudinal end view of the structure of FIG. **1**.

FIG. **3** is a sectional view as indicated in FIG. **2**.

FIG. **4** redepicts the structure of FIG. **1**, the view of FIG. **4** showing body leaf components pivoted to their closed positions.

FIG. **5** redepicts the structure of FIG. **2**, the view of FIG. **5** showing body leaf components pivoted to their closed positions.

FIG. **6** is a sectional view as indicated in FIG. **5**.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now to the drawings and in particular to Drawing FIG. **1**, a preferred embodiment of the instant inventive writing instrument is referred to generally by Reference Arrow **1**. Knuckles **2**, **4**, **6**, and **8** are preferably configured as cylindrical sleeves in a shape and functional manner common to the central knuckle components of a double leaf door hinge. Referring further simultaneously to FIG. **3**, upon an alignment of knuckles **2**, **4**, **6**, and **8** in the manner depicted, a common longitudinally extending bore **10** extending through such knuckles is advantageously formed. The bore **10** preferably comprises each of the bores of the knuckles **2**, **4**, **6**, and **8**.

Referring further simultaneously to FIGS. **1** and **3**, in order to allow the aligned knuckles **2**, **4**, **6**, and **8** to facilitate pivoting movement of supported components in the manner of a leaf hinge, a tube member and scribing means combination preferably extends longitudinally through bore **10**, such combination there functioning similarly with a common hinge pin. In a preferred embodiment, the tube member and scribing means combination comprises a radially outer tube **12**,**14** and a colorant cartridge **16** which is nestingly received within and extends through the bore of the outer tube **12**,**14**. The colorant cartridge **16** is intended as being representative of other commonly known scribing or writing utensils such as pencils, and the colorant cartridge may suitably contain, store, and dispense common surface printing fluids such as ink, paint, and water color. Where the colorant contained within the cartridge **16** comprises ink, a ballpoint pen tip **18** may be advantageously mounted in communication with the longitudinal end of cartridge **16**.

Referring simultaneously to FIGS. **1**-**3**, the instant inventive writing instrument preferably further comprises first and second leaves **20** and **22**. The first leaf **20** is preferably fixedly attached to or formed wholly both with the oppositely-longitudinalmost with knuckle **2** and with knuckle **6**, while the second leaf **22** is similarly fixedly attached to or formed wholly both with the longitudinalmost knuckle **8** and with knuckle **4**. Leaves **20** and **22** may freely pivot about tube **12**,**14** between the openend writing use positions represented by Drawing FIGS. **1**, **2**, and **3**, and the closed compact storage positions represented by Drawing FIGS. **4**, **5**, and **6**. The longitudinal ends of leaves **20** and **22** preferably present sloped surfaces **24** and **26** for facilitating ergonomic writing while the leaves are at their opened positions. Also preferably, the proximal end of leaf **20** is configured present a counter-distal extension **28**. Upon pivoting of leaves **20** and **22** to their opened position, the lateral cross-sectional shape of the writing instrument as defined by distal ends **21** and **23** and by the counter-distal extension **28** is substantially triangular. Such triangular cross-sectional configuration of the writing instrument **1** further ergonomically assists the user of the instrument during writing.

Referring simultaneously to all figures, the instant inventive writing instrument **1** preferably incorporates extending and retracting means which are capable of longitudinally extending the tube **12**,**14**, cartridge **16**, and pen tip **18** combination with respect to the longitudinal end of the instrument so that pen tip **18** may protrude longitudinally from port **30** of cap **42** as indicated in Drawing FIGS. **1** and **3**, and are further capable of oppositely-longitudinally retracting such structures within the bore **10** to the non-writing/storage position represented by Drawing FIGS. **4** and **6**.

In the preferred embodiment, such means for longitudinal extension and oppositely-longitudinal retraction comprise a helical slide ridge and slide channel combination as represented in Drawing FIGS. **3** and **6**. The slide channels **32** of such combination (the second slide channel being situated at the opposite side of tube segment **14** according to the view of FIG. **6**) are preferably helical and are presented at and about the outer surface of a longitudinal segment **14** of the tube member **12**,**14**. The slide ridges **34** may extend radially inwardly from the bore wall of knuckle **8** into bore **10** for engagement within the helical channels **32**. Upon pivoting opening motions of leaves **20** and **22** with respect to each other from the FIG. **6** configuration to the FIG. **3** configuration, longitudinally facing surfaces of the slide ridges **34** bias against the sloped oppositely-longitudinally facing walls of the helical slide channels **32**, such contact tending to slidably move the tube **12**,**14** (along with attached cartridge **16** and pen point **18** components) longitudinally within knuckle bore **10**, such motion longitudinally protruding the pen point **18** from port **30**. In order to facilitate longitudinal reciprocating motions of the tube, cartridge, and pen tip components **12**,**14**,**16**,**18** within bore **10** while preventing any screw actuated rotation of such components, the oppositely-longitudinal end of tube **12** preferably presents slide ridges **36** which are nestingly and slidably received within slide channels **38** formed within the instrument's first or oppositely-longitudinalmost knuckle **2**. Accordingly, ridges and channels **36** and **38** operatively engage leaf **20** for rotation stopping while ridges **34** and channels **32** operatively engage leaf **22** for extension and retraction. Such ridge and channel engagements advantageously allow pivoting and counter-pivoting motions of the leaves **20** and **22** with respect to each other to longitudinally reciprocatingly move the instrument's scribing elements.

In assembling the instant inventive writing instrument **1**, knuckles **2**, **4**, **6**, and **8** may be interstitially arranged with respect to each other as indicated in FIG. **3** so that the knuckle bore **10** becomes longitudinally aligned. Thereafter, with end caps **40** and **42** initially removed, tube **12** including its nestingly mounted cartridge **16** may be inserted longitudinally through bore **10** until slide ridges **36** engage slide channels **38** of the first or oppositely-longitudinalmost knuckle **2**. Thereafter, the longitudinal segment **14** of tube **12**,**14** may be oppositely-longitudinally inserted into the bore of the second or longitudinalmost knuckle **8**, such insertion causing slide ridges **34** to enter helical slide channels **32** from those channels openings at the oppositely-longitudinal end of tube segment **14**. Extension of segment **14** continues until such oppositely-longitudinal end abuts and is stopped by a longitudinally facing land **13** of tube **12**. A liquid adhesive is preferably applied to the bore wall of segment **14** immediately prior to such oppositely-longitudinal insertion, such adhesive subsequently hardening, and advantageously causing tube members **12** and **14** to comprise the solid and unitary tube component **12**,**14**. Following such assembly and installation of tube and scribing element components, end caps **40** and **42** may be snapped into place as indicated in Drawing FIGS. **3** and **6**.

In use of the instant inventive writing instrument **1**, the distal ends **21** and **23** of pen body leaves **20** and **22** may be

initially positioned substantially adjacent each other by pivoting the leaves **20** and **22** circumferentially or orbitally toward each other to their closed positions as depicted in FIGS. **4**, **5**, and **6**. Upon such initial configuration, pen point **18** is advantageously retracted within bore **10**, and the body of the instrument **1** is compactly collapsed for convenient storage. The compact closed configuration of the instrument **1** advantageously facilitates storage within a shirt pocket (not depicted within views), with attached pocket clip **44** engaging a pocket edge.

Opposite circumferential movement of the distal ends **21** and **23** of leaves **20** and **22** from the storage configuration of FIGS. **4-6** to the use configuration of FIGS. **1-3** advantageously orbitally moves ridges **34** about tube **12**,**14** while such ridges remain nestingly received within helical slide channels **32**. Such orbiting engagement of ridges **34** causes pen point **18** to longitudinally extend from port **30** within cap **42**. During such extension, the ridge and slide channel combination **36**,**38** at the oppositely-longitudinal end of the instrument resists rotation of the tube **12**,**14**. Upon completion of such extension, the combined engagements of ridges **34** and **36** with channels **32** and **38** preserves the longitudinal extension of pen point **18** against the oppositely-longitudinally directed counter-pressure of a writing surface against the pen point **18**.

The ergonomically triangular cross-sectional shape of the instrument is manually preserved during handwriting use of the instrument **1** by the fingers of a user's hand. Normal finger pressure exerted during writing against leaves **20** and **22** and against their longitudinal edges **24** and **26** mechanically preserves the extended orientation of pen point **18** through the combined actions of slide ridge and slide channels **36** and **38**, and slide ridge and slide channels **34** and **32**. Repeated opening and closings of leaves **20** and **22** advantageously repeatedly and simultaneously extends and retracts pen point **18**.

While the principles of the invention have been made clear in the above illustrative embodiment, those skilled in the art may make modifications in the structure, arrangement, portions and components of the invention without departing from those principles. Accordingly, it is intended that the description and drawings be interpreted as illustrative and not in the limiting sense, and that the invention be given a scope commensurate with the appended claims.

The invention claimed is:

1. A writing instrument comprising:

(a) a plurality of knuckles arranged in a longitudinal series;

(b) a tube and scriber combination wherein the scriber comprises a colorant carrying cartridge, said combination extending through the knuckles, said combination's scriber being mounted within the tube and having a longitudinal scribing end;

(c) first and second leaves, each leaf among the first and second leaves having proximal and distal ends, the first and second leaves being connected operatively to the knuckles for movement between closed and opened positions, the distal ends being adjacent each other upon movements of the first and second leaves to their closed positions, the distal ends being displaced circumferentially from each other upon movements of the first and second leaves toward their opened positions; and

(d) a screw actuator assembly adapted for alternately longitudinally extending the tube and scriber combination with respect to the knuckles and for oppositely longitudinally retracting said combination, said assembly being connected operatively to the tube, wherein a first knuckle among the plurality of knuckles is fixedly attached to or formed wholly with the first leaf, wherein a second knuckle among the plurality of knuckles is fixedly attached to or formed wholly with the second leaf, and wherein the screw actuator assembly comprises first and second slide ridge and slide channel combinations, the second slide ridge and slide channel combination's slide channel being helical, and wherein the second slide ridge and slide channel combination is adapted for actuating the tube and scriber combination's longitudinal extension upon movement of the first and second leaves toward their opened positions, and is adapted for alternately actuating the tube and scriber combination's oppositely longitudinal retraction upon movement of the first and second leaves toward their closed positions.

2. The writing instrument of claim **1** wherein the second slide ridge and slide channel combination's slide channel opens radially outwardly from the tube and scriber combination's tube and wherein said combination's slide ridge extends radially inwardly from the second knuckle.

3. The writing instrument of claim **2** wherein the first slide ridge and slide channel combination's slide channel opens radially inwardly at the first knuckle.

4. The writing instrument of claim **3** wherein the second knuckle is spaced longitudinally from the first knuckle.

5. The writing instrument of claim **4** wherein the first and second knuckles are respectively oppositely longitudinalmost and longitudinalmost knuckles among the plurality of knuckles.

6. The writing instrument of claim **5** further comprising first and second caps respectively mounted over ends of the first and second knuckles.

7. A writing instrument comprising:

(a) a plurality of knuckles arranged in a longitudinal series;

(b) a tube and scriber combination extending through the knuckles, said combination's scriber being mounted within the tube and having a longitudinal scribing end;

(c) first and second leaves, each leaf among the first and second leaves having proximal and distal ends, the first and second leaves being connected operatively to the knuckles for movement between closed and opened positions, the distal ends being adjacent each other upon movements of the first and second leaves to their closed positions, the distal ends being displaced circumferentially from each other upon movements of the first and second leaves toward their opened positions, wherein, upon movements of the first and second leaves to their opened positions, the writing instrument's lateral cross-sectional shape becomes substantially triangularly configured.

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